FATIMA JINNAH WOMEN UNIVERSITY

DEPARTMENT OF SOFTWARE ENGINEERING

SUBMITTED BY:

Tanzeela Asghar
(2021-BSE-032)

SEMESTER:

V-A

COURSE:

CLOUD COMPUTING LAB
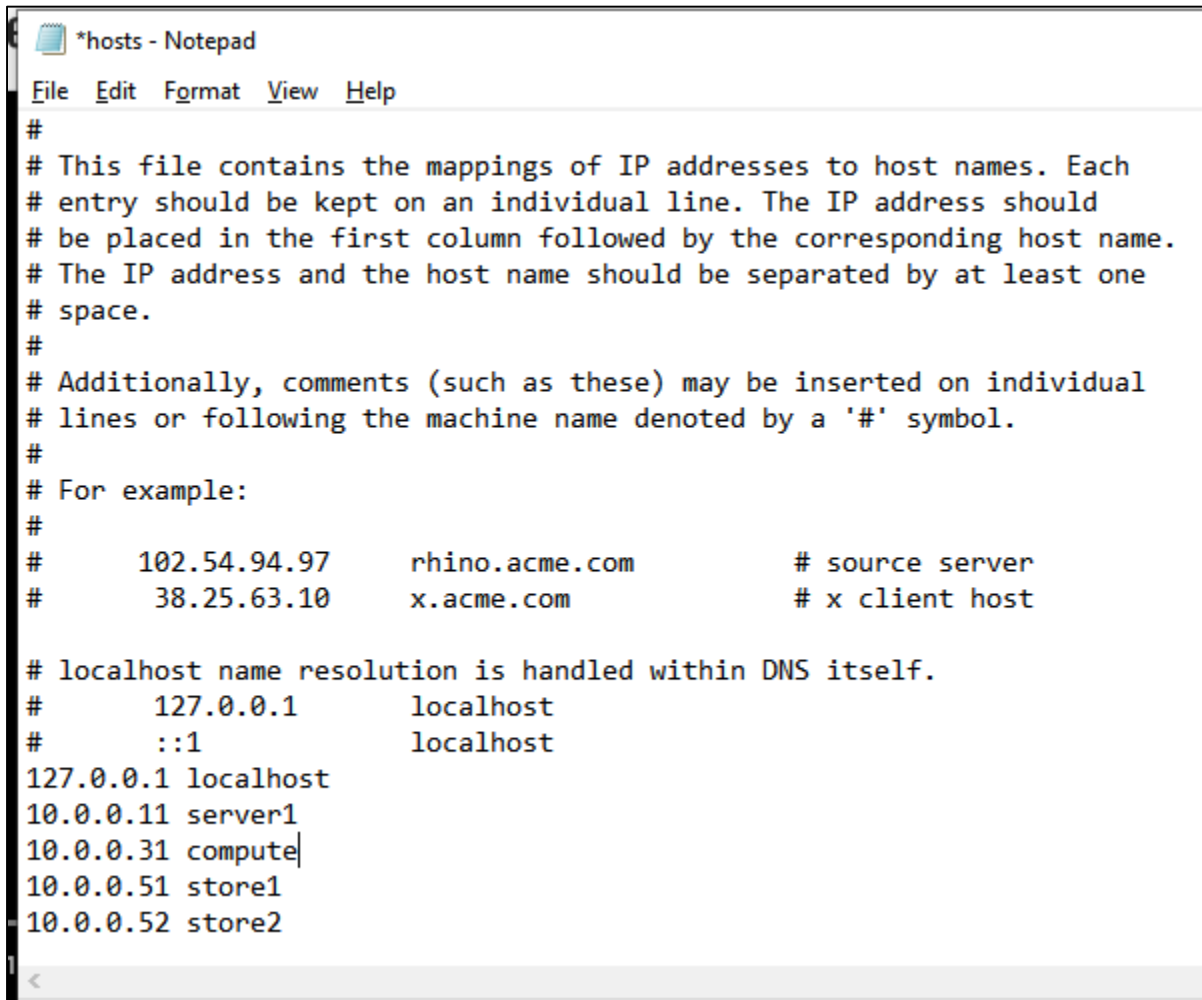
SUBMITTED TO:

ENGR. SHAHZAD NAZIR

LAB-09

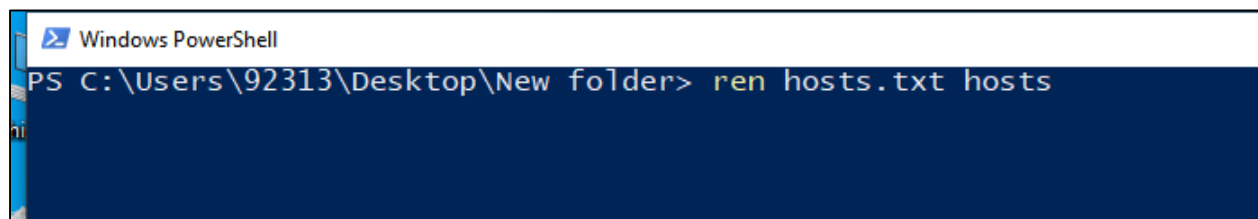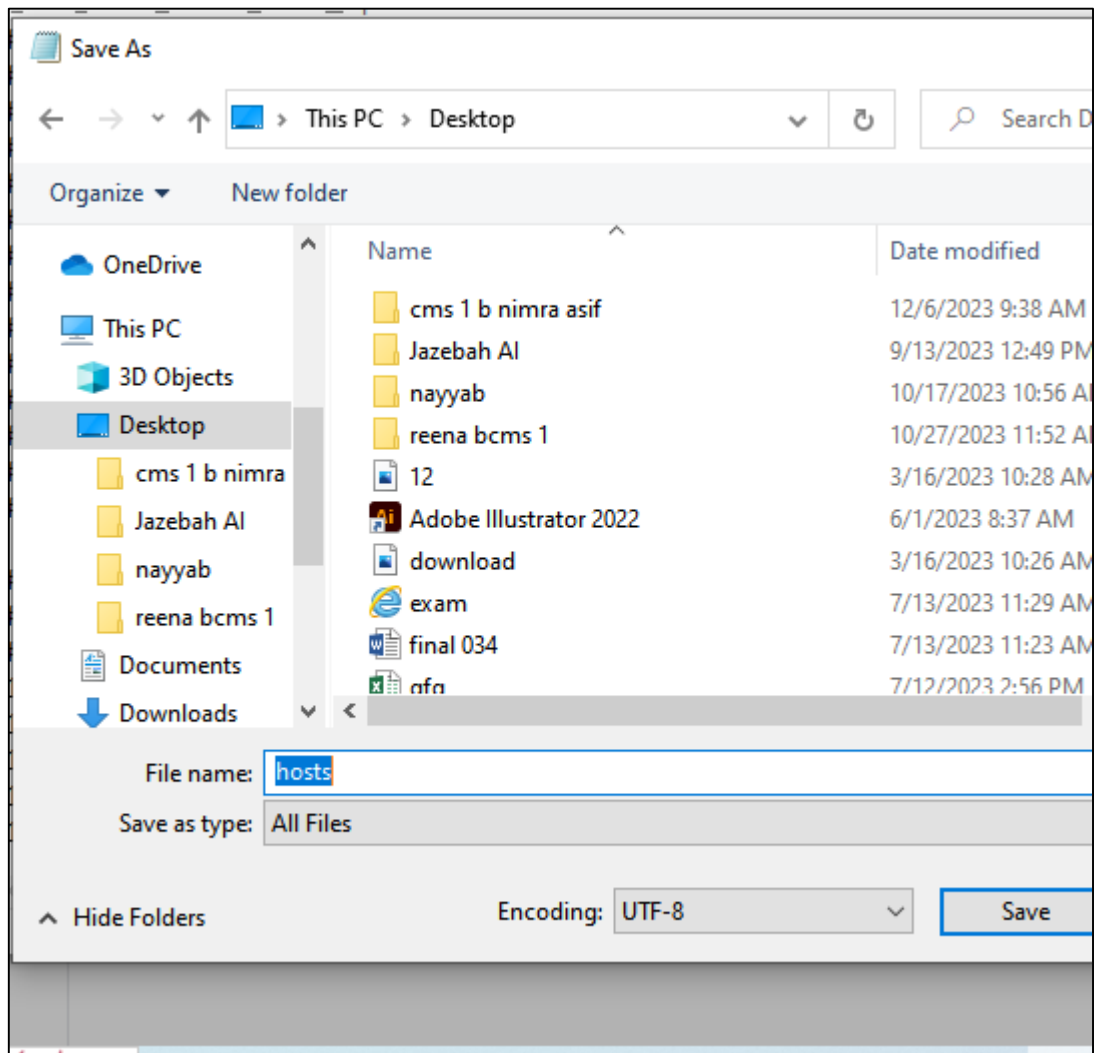**Installing MariaDB, rabbitMQ, Memcached etcd for Openstack stein on centos:**

Step 1:

Accessing nodes from host machine:

```
*hosts - Notepad

File   Edit   Format   View   Help
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#      102.54.94.97      rhino.acme.com          # source server
#       38.25.63.10      x.acme.com              # x client host

# localhost name resolution is handled within DNS itself.
#       127.0.0.1        localhost
#       ::1              localhost
127.0.0.1 localhost
10.0.0.11 server1
10.0.0.31 compute
10.0.0.51 store1
10.0.0.52 store2
```
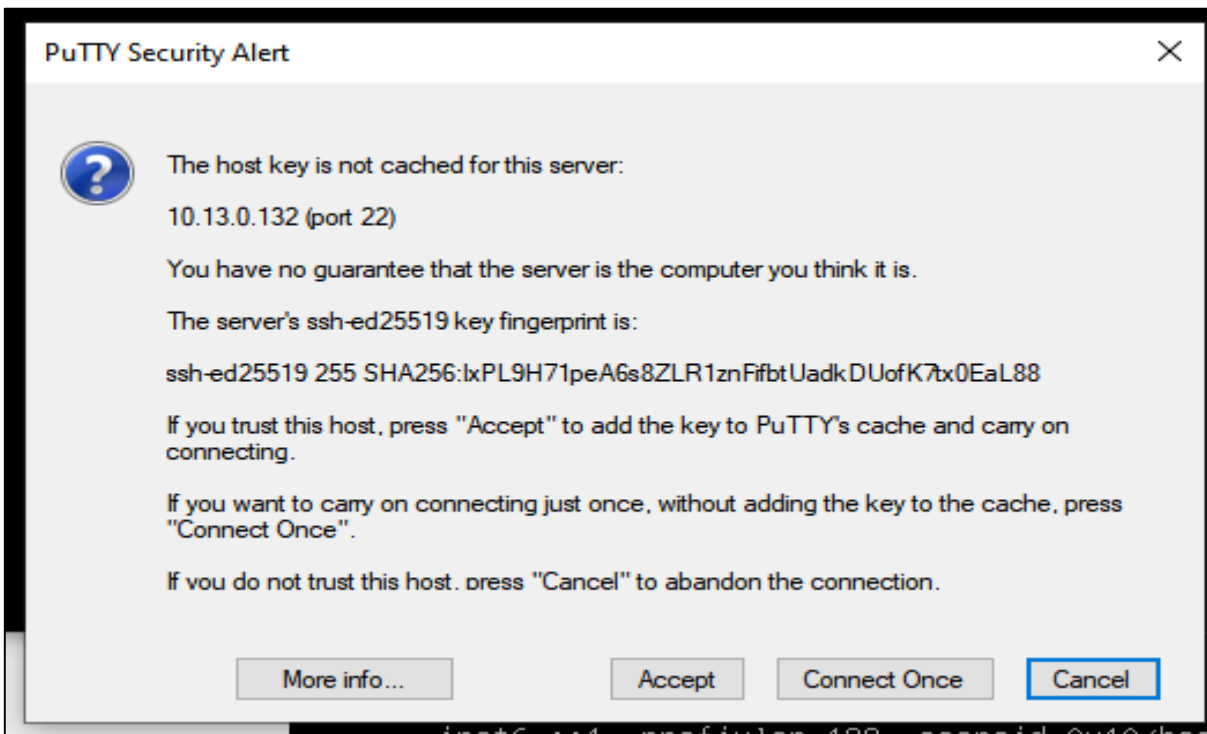
Change extension of "hosts.txt" to only "hosts" file.

Resolve Putty error:

PuTTY Security Alert

The host key is not cached for this server:

10.13.0.132 (port 22)

You have no guarantee that the server is the computer you think it is.

The server's ssh-ed25519 key fingerprint is:

ssh-ed25519 255 SHA256:lxPL9H71peA6s8ZLR1znFifbtUadkDUofK7tx0EaL88

If you trust this host, press "Accept" to add the key to PuTTY's cache and carry on connecting.

If you want to carry on connecting just once, without adding the key to the cache, press "Connect Once".

If you do not trust this host, press "Cancel" to abandon the connection.

| More info... | | Accept | Connect Once | Cancel |

```
fjwu@server1: ~

login as: fjwu
fjwu@10.13.0.132's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-213-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 System information as of Thu Dec  7 09:38:29 UTC 2023

 System load:  0.0                 Users logged in:       1
 Usage of /:   41.4% of 9.59GB     IP address for enp0s3: 10.0.2.15
 Memory usage: 4%                  IP address for enp0s8: 10.0.0.11
 Swap usage:   0%                  IP address for enp0s9: 10.13.0.132
 Processes:    101


Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
```

```
Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Thu Dec  7 09:13:10 2023
fjwu@server1:~$
```
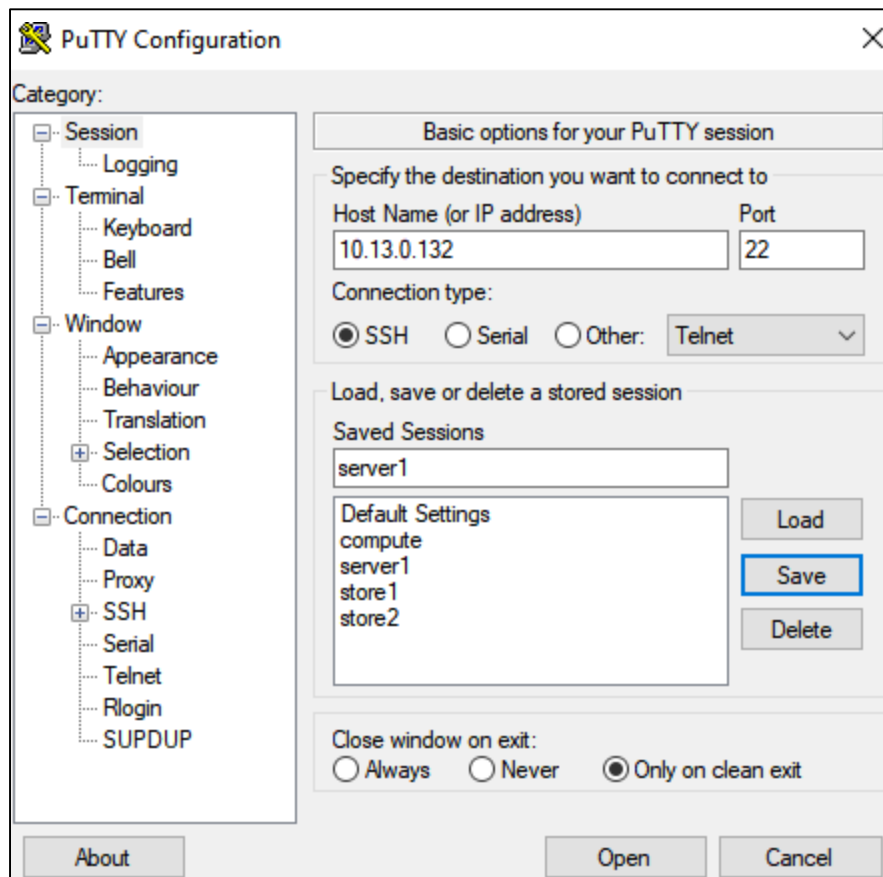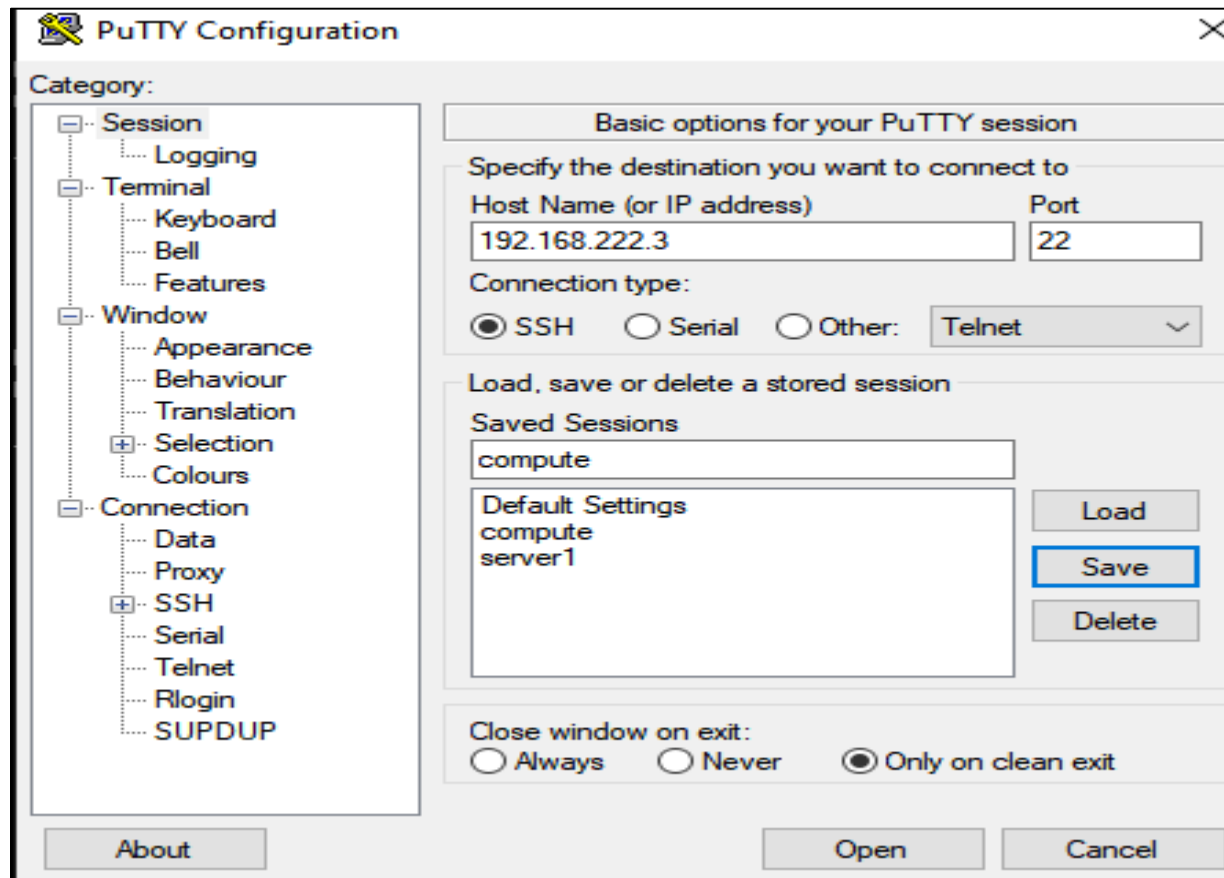


```
Last login: Thu Dec  7 09:13:10 2023
fjwu@server1:~$ clear
```
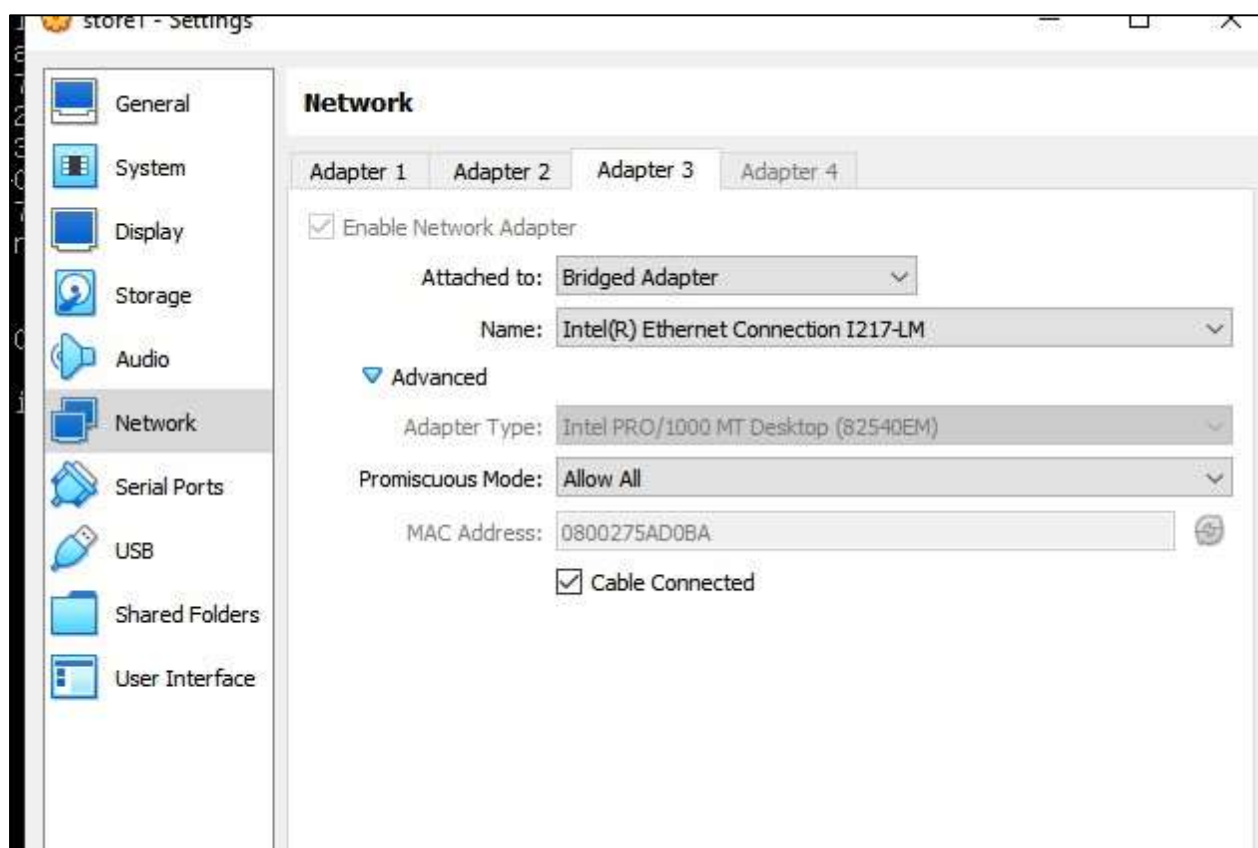

Compute:

```
fjwu@compute:~$ sudo apt install ssh
[sudo] password for fjwu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libwrap0 ncurses-term openssh-server openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere rssh ssh-askpass
The following NEW packages will be installed:
  libwrap0 ncurses-term openssh-server openssh-sftp-server ssh ssh-import-id
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 688 kB of archives.
After this operation, 5,534 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 openssh-sftp-server amd64 1:7.6p
1-4ubuntu0.7 [45.5 kB]
```
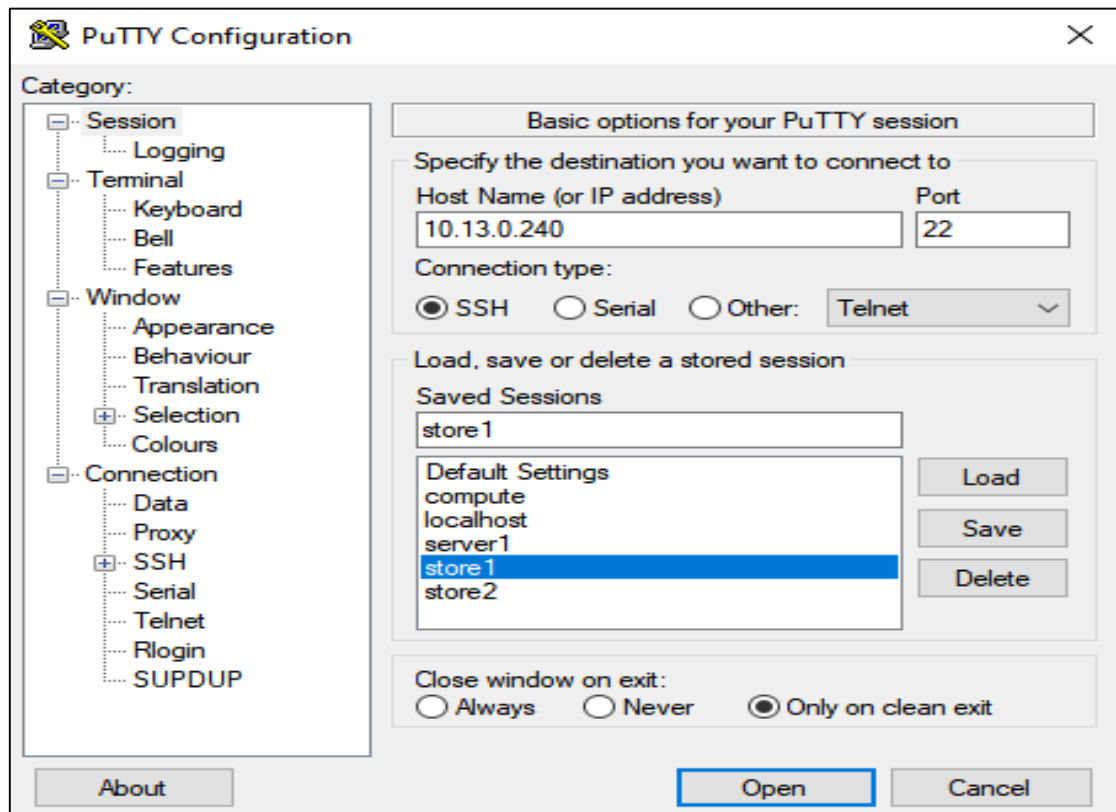
```
1-4ubuntu0.7 [45.5 kB]
Get:2 http://pk.archive.ubuntu.com/ubuntu bionic/main amd64 libwrap0 amd64 7.6.q-27 [46.3 kB]
Get:3 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 openssh-server amd64 1:7.6p1-4ub
untu0.7 [332 kB]
Get:4 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 ssh all 1:7.6p1-4ubuntu0.7 [5,19
2 B]
Get:5 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 ncurses-term all 6.1-1ubuntu1.18
.04.1 [248 kB]
Get:6 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 ssh-import-id all 5.7-0ubuntu1.1
 [10.9 kB]
Fetched 688 kB in 4s (188 kB/s)
Preconfiguring packages ...
Selecting previously unselected package openssh-sftp-server.
(Reading database ... 69121 files and directories currently installed.)
Preparing to unpack .../0-openssh-sftp-server_1%3a7.6p1-4ubuntu0.7_amd64.deb ...
Unpacking openssh-sftp-server (1:7.6p1-4ubuntu0.7) ...

Progress: [  3%] [##.............................................................................] A
```

```
Setting up ssh (1:7.6p1-4ubuntu0.7) ...
Processing triggers for systemd (237-3ubuntu10.57) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ufw (0.36-0ubuntu0.18.04.2) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
fjwu@compute:~$ sudo systemctl start ssh
fjwu@compute:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-07 10:06:11 UTC; 27s ago
 Main PID: 3254 (sshd)
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/ssh.service
           └─3254 /usr/sbin/sshd -D

Dec 07 10:06:11 compute systemd[1]: Starting OpenBSD Secure Shell server...
Dec 07 10:06:11 compute sshd[3254]: Server listening on 0.0.0.0 port 22.
Dec 07 10:06:11 compute sshd[3254]: Server listening on :: port 22.
Dec 07 10:06:11 compute systemd[1]: Started OpenBSD Secure Shell server.
fjwu@compute:~$
```

```
fjwu@compute: ~                                              —  □  ×

login as: fjwu
fjwu@10.13.0.237's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-213-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 System information as of Thu Dec  7 10:32:36 UTC 2023

 System load:  0.98               Users logged in:       1
 Usage of /:   41.6% of 9.59GB    IP address for enp0s3: 10.0.2.15
 Memory usage: 15%                IP address for enp0s8: 192.168.127.3
 Swap usage:   0%                 IP address for enp0s9: 10.13.0.237
 Processes:    111

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.
```

```
store1 - Settings                                           —  □  ×

  General          Network

  System           Adapter 1   Adapter 2   Adapter 3   Adapter 4

  Display            ☑ Enable Network Adapter

  Storage                  Attached to:  Bridged Adapter         ∨

  Audio                          Name:  Intel(R) Ethernet Connection I217-LM    ∨

  Network                ▽ Advanced

  Serial Ports           Adapter Type:  Intel PRO/1000 MT Desktop (82540EM)     ∨

  USB                 Promiscuous Mode:  Allow All                              ∨

  Shared Folders          MAC Address:  0800275AD0BA                           ⊕

  User Interface                        ☑ Cable Connected
```

PuTTY Configuration

Category:
- Session
  - Logging
- Terminal
  - Keyboard
  - Bell
  - Features
- Window
  - Appearance
  - Behaviour
  - Translation
  - Selection
  - Colours
- Connection
  - Data
  - Proxy
  - SSH
  - Serial
  - Telnet
  - Rlogin
  - SUPDUP

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): 10.13.0.240   Port: 22

Connection type:
(●) SSH   ( ) Serial   ( ) Other: Telnet

Load, save or delete a stored session

Saved Sessions: store1

- Default Settings
- compute
- localhost
- server1
- store1
- store2

Load / Save / Delete

Close window on exit:
( ) Always   ( ) Never   (●) Only on clean exit

About   Open   Cancel

---

fjwu@store1: ~

```
 Usage of /:    41.4% of 9.59GB    IP address for enp0s3: 10.0.2.15
 Memory usage: 17%                 IP address for enp0s8: 192.168.127.3
 Swap usage:   0%                  IP address for enp0s9: 10.13.0.240
 Processes:    113

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Thu Dec  7 10:35:06 2023
fjwu@store1:~$
```
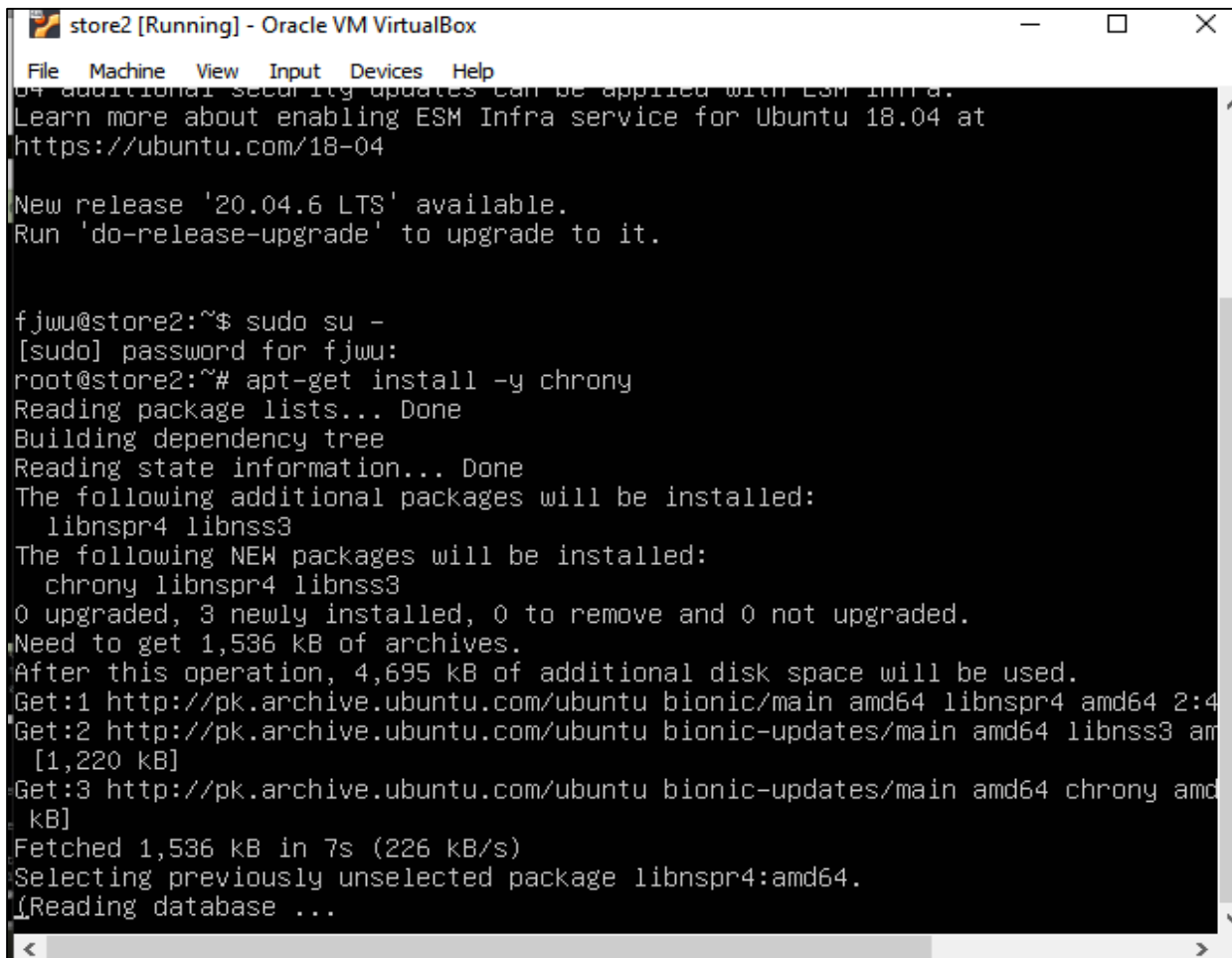
```
Enable ESM Infra to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


fjwu@store2:~$ sudo apt install ssh
[sudo] password for fjwu:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libwrap0 ncurses-term openssh-server openssh-sftp-server ssh-import-:
Suggested packages:
  molly-guard monkeysphere rssh ssh-askpass
The following NEW packages will be installed:
  libwrap0 ncurses-term openssh-server openssh-sftp-server ssh ssh-impc
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 688 kB of archives.
After this operation, 5,534 kB of additional disk space will be used.
Do you want to continue? [Y/n] _
```

fjwu@store2: ~

```
login as: fjwu
fjwu@10.13.0.241's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-213-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Thu Dec  7 10:42:53 UTC 2023

  System load:  0.15              Users logged in:       1
  Usage of /:   41.5% of 9.59GB   IP address for enp0s3: 10.0.2.15
  Memory usage: 18%               IP address for enp0s8: 10.0.0.52
  Swap usage:   0%                IP address for enp0s9: 10.13.0.241
  Processes:    112

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8
   just raised the bar for easy, resilient and secure K8s cluster deployment
```

```
    https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Thu Dec  7 10:41:08 2023
fjwu@store2:~$ █
```

Store2:

```
store2 [Running] - Oracle VM VirtualBox                        —    □    ✕

File   Machine   View   Input   Devices   Help
04 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


fjwu@store2:~$ sudo su -
[sudo] password for fjwu:
root@store2:~# apt-get install -y chrony
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libnspr4 libnss3
The following NEW packages will be installed:
  chrony libnspr4 libnss3
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 1,536 kB of archives.
After this operation, 4,695 kB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu bionic/main amd64 libnspr4 amd64 2:4
Get:2 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libnss3 am
 [1,220 kB]
Get:3 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 chrony amd
 kB]
Fetched 1,536 kB in 7s (226 kB/s)
Selecting previously unselected package libnspr4:amd64.
(Reading database ...
```

```
root@server1: ~                                    —    □    ✕
fjwu@server1:~$ sudo su -
[sudo] password for fjwu:
root@server1:~# apt-get install chrony
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libnspr4 libnss3
The following NEW packages will be installed:
  chrony libnspr4 libnss3
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 1,536 kB of archives.
After this operation, 4,695 kB of additional disk space will be used.
Do you want to continue? [Y/n] █
```



```
root@store1: ~                                    —    □
fjwu@store1:~$ sudo su -
[sudo] password for fjwu:
root@store1:~# get-apt install -y chrony
get-apt: command not found
root@store1:~# apt-get install -y chrony
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libnspr4 libnss3
The following NEW packages will be installed:
  chrony libnspr4 libnss3
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 1,536 kB of archives.
After this operation, 4,695 kB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu bionic/main amd64 libnspr4 amd64 2:4
8-1ubuntu1 [112 kB]
Get:2 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libnss3 amd
4 2:3.35-2ubuntu2.16 [1,220 kB]
18% [2 libnss3 114 kB/1,220 kB 9%]█
```

Step 2:

Network time protocol - chrony

Network to allow 10.0.0./24

```
# down (compare to just using one of the lines). See (LP: #1754358) for the
# discussion.
#
# About using servers from the NTP Pool Project in general see (LP: #104525).
# Approved by Ubuntu Technical Board on 2011-02-08.
# See http://www.pool.ntp.org/join.html for more information.
pool ntp.ubuntu.com        iburst maxsources 4
pool 0.ubuntu.pool.ntp.org iburst maxsources 1
pool 1.ubuntu.pool.ntp.org iburst maxsources 1
pool 2.ubuntu.pool.ntp.org iburst maxsources 2

# This directive specify the location of the file containing ID/key pairs for
# NTP authentication.
keyfile /etc/chrony/chrony.keys

# This directive specify the file into which chronyd will store the rate
# information.
driftfile /var/lib/chrony/chrony.drift

# Uncomment the following line to turn logging on.
#log tracking measurements statistics

# Log files location.
logdir /var/log/chrony

# Stop bad estimates upsetting machine clock.
maxupdateskew 100.0

# This directive enables kernel synchronisation (every 11 minutes) of the
# real-time clock. Note that it can't be used along with the 'rtcfile' directive.
rtcsync

# Step the system clock instead of slewing it if the adjustment is larger than
# one second, but only in the first three clock updates.
makestep 1 3
allow 10.0.0.0/24
:wq
```

```
root@store1:~# systemctl enable chrony
Synchronizing state of chrony.service with SysV service script with /lib/systemd/systemd-sysv-insta
l.
Executing: /lib/systemd/systemd-sysv-install enable chrony
root@store1:~# systemctl start chrony
root@store1:~# systemctl status chrony
● chrony.service – chrony, an NTP client/server
   Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-12-08 03:40:39 UTC; 8min ago
     Docs: man:chronyd(8)
           man:chronyc(1)
           man:chrony.conf(5)
 Main PID: 1650 (chronyd)
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/chrony.service
           └─1650 /usr/sbin/chronyd

Dec 08 03:40:36 store1 systemd[1]: Starting chrony, an NTP client/server...
Dec 08 03:40:38 store1 chronyd[1650]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PR
Dec 08 03:40:39 store1 systemd[1]: Started chrony, an NTP client/server.
Dec 08 03:40:49 store1 chronyd[1650]: Selected source 103.55.68.158
Dec 08 03:40:59 store1 chronyd[1650]: Source 2001:da8:9000::130 replaced with 59.103.236.9
lines 1-16/16 (END)
```

```
# down (compare to just using one of the lines). See (LP: #1754358) for the
# discussion.
#
# About using servers from the NTP Pool Project in general see (LP: #104525).
# Approved by Ubuntu Technical Board on 2011-02-08.
# See http://www.pool.ntp.org/join.html for more information.
pool ntp.ubuntu.com        iburst maxsources 4
pool 0.ubuntu.pool.ntp.org iburst maxsources 1
pool 1.ubuntu.pool.ntp.org iburst maxsources 1
pool 2.ubuntu.pool.ntp.org iburst maxsources 2

# This directive specify the location of the file containing ID/key pairs for
# NTP authentication.
keyfile /etc/chrony/chrony.keys

# This directive specify the file into which chronyd will store the rate
# information.
driftfile /var/lib/chrony/chrony.drift

# Uncomment the following line to turn logging on.
#log tracking measurements statistics

# Log files location.
logdir /var/log/chrony

# Stop bad estimates upsetting machine clock.
maxupdateskew 100.0

# This directive enables kernel synchronisation (every 11 minutes) of the
# real-time clock. Note that it can't be used along with the 'rtcfile' directive.
rtcsync

# Step the system clock instead of slewing it if the adjustment is larger than
# one second, but only in the first three clock updates.
makestep 1 3
allow 10.0.0.0/24
                                                                46,17        Bot
```

```
root@store2:~# systemctl enable chrony
Synchronizing state of chrony.service with SysV service script with /lib/systemd/systemd-sysv-instal
l.
Executing: /lib/systemd/systemd-sysv-install enable chrony
root@store2:~# systemctl start chrony
root@store2:~# systemctl status chrony
● chrony.service - chrony, an NTP client/server
   Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-12-08 06:24:53 UTC; 11min ago
     Docs: man:chronyd(8)
           man:chronyc(1)
           man:chrony.conf(5)
 Main PID: 1310 (chronyd)
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/chrony.service
           └─1310 /usr/sbin/chronyd

Dec 08 06:24:51 store2 systemd[1]: Starting chrony, an NTP client/server...
Dec 08 06:24:52 store2 chronyd[1310]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PRI
Dec 08 06:24:53 store2 systemd[1]: Started chrony, an NTP client/server.
Dec 08 06:25:01 store2 chronyd[1310]: Selected source 103.55.68.158
Dec 08 06:25:01 store2 chronyd[1310]: System clock wrong by 1.704545 seconds, adjustment started
Dec 08 06:25:02 store2 chronyd[1310]: System clock was stepped by 1.704545 seconds
Dec 08 06:25:14 store2 chronyd[1310]: Source 2001:1490:0:800::41 replaced with 59.103.236.9
Dec 08 06:31:32 store2 chronyd[1310]: Selected source 185.125.190.58
lines 1-19/19 (END)
```

```
fjwu@server1:~$ sudo su -
[sudo] password for fjwu:
root@server1:~#
```

```
# down (compare to just using one of the lines). See (LP: #1754358) for the
# discussion.
#
# About using servers from the NTP Pool Project in general see (LP: #104525).
# Approved by Ubuntu Technical Board on 2011-02-08.
# See http://www.pool.ntp.org/join.html for more information.
pool ntp.ubuntu.com          iburst maxsources 4
pool 0.ubuntu.pool.ntp.org iburst maxsources 1
pool 1.ubuntu.pool.ntp.org iburst maxsources 1
pool 2.ubuntu.pool.ntp.org iburst maxsources 2

# This directive specify the location of the file containing ID/key pairs for
# NTP authentication.
keyfile /etc/chrony/chrony.keys

# This directive specify the file into which chronyd will store the rate
# information.
driftfile /var/lib/chrony/chrony.drift

# Uncomment the following line to turn logging on.
#log tracking measurements statistics

# Log files location.
logdir /var/log/chrony

# Stop bad estimates upsetting machine clock.
maxupdateskew 100.0

# This directive enables kernel synchronisation (every 11 minutes) of the
# real-time clock. Note that it can't be used along with the 'rtcfile' directive.
rtcsync

# Step the system clock instead of slewing it if the adjustment is larger than
# one second, but only in the first three clock updates.
makestep 1 3
allow 10.0.0.0/24
-- INSERT --                                                    46,18         Bot
```

```
maxupdateskew 100.0

# This directive enables kernel synchronisation (every 11 minutes) of the
# real-time clock. Note that it can't be used along with the 'rtcfile' directive.
rtcsync

# Step the system clock instead of slewing it if the adjustment is larger than
# one second, but only in the first three clock updates.
makestep 1 3
allow 10.0.0.0/24

"/etc/chrony/chrony.conf" 47L, 1787C written
root@server1:~# systemctl enable chrony
Synchronizing state of chrony.service with SysV service script with /lib/systemd/systemd-sysv-instal
l.
Executing: /lib/systemd/systemd-sysv-install enable chrony
root@server1:~# systemctl start chrony
root@server1:~# systemctl status chrony
● chrony.service - chrony, an NTP client/server
   Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-12-08 03:39:39 UTC; 1h 3min ago
     Docs: man:chronyd(8)
           man:chronyc(1)
           man:chrony.conf(5)
 Main PID: 1572 (chronyd)
    Tasks: 1 (limit: 4653)
   CGroup: /system.slice/chrony.service
           └─1572 /usr/sbin/chronyd

Dec 08 03:39:35 server1 systemd[1]: Starting chrony, an NTP client/server...
Dec 08 03:39:38 server1 chronyd[1572]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PR
Dec 08 03:39:39 server1 systemd[1]: Started chrony, an NTP client/server.
Dec 08 03:39:46 server1 chronyd[1572]: Selected source 203.80.128.20
Dec 08 03:40:00 server1 chronyd[1572]: Source 2001:470:1d:281::123 replaced with 59.103.236.10
Dec 08 03:41:59 server1 chronyd[1572]: Received KoD RATE from 203.80.128.20
Dec 08 03:48:25 server1 chronyd[1572]: Selected source 59.103.236.10
lines 1-18/18 (END)
```

Compute:

```
root@compute:~# systemctl enable chrony
Synchronizing state of chrony.service with SysV service script with /lib/systemd/systemd-sysv-instal
l.
Executing: /lib/systemd/systemd-sysv-install enable chrony
root@compute:~# systemctl start chrony
root@compute:~# systemctl status chrony
● chrony.service - chrony, an NTP client/server
   Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-12-08 08:36:37 UTC; 3min 0s ago
     Docs: man:chronyd(8)
           man:chronyc(1)
           man:chrony.conf(5)
 Main PID: 1407 (chronyd)
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/chrony.service
           └─1407 /usr/sbin/chronyd

Dec 08 08:36:33 compute systemd[1]: Starting chrony, an NTP client/server...
Dec 08 08:36:34 compute chronyd[1407]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PR
Dec 08 08:36:37 compute systemd[1]: Started chrony, an NTP client/server.
Dec 08 08:36:44 compute chronyd[1407]: Selected source 185.125.190.58
Dec 08 08:36:44 compute chronyd[1407]: System clock wrong by 1.967953 seconds, adjustment started
Dec 08 08:36:46 compute chronyd[1407]: System clock was stepped by 1.967953 seconds
Dec 08 08:38:56 compute chronyd[1407]: Selected source 103.55.68.158
lines 1-18/18 (END)
```
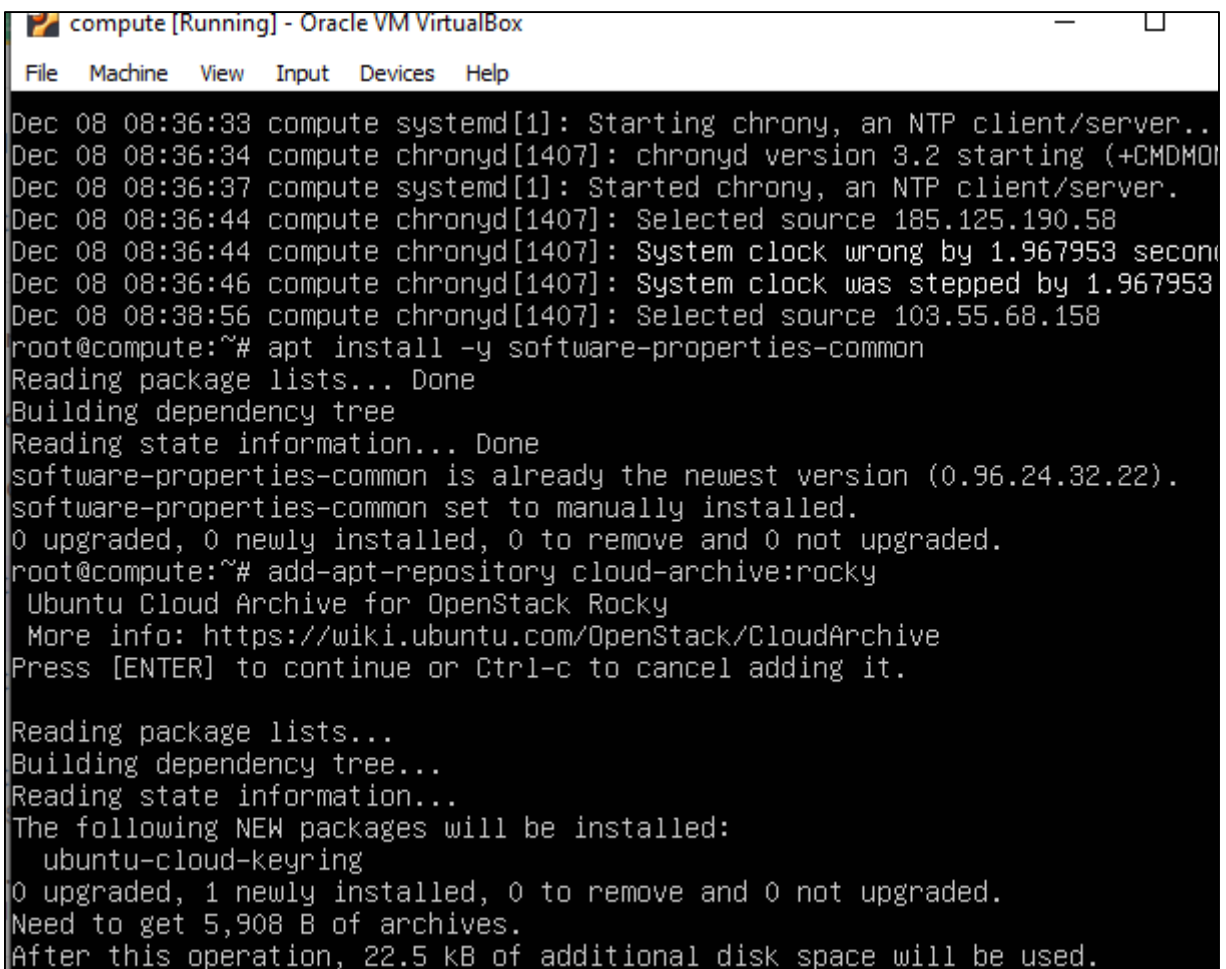
Step 3:

Ubuntu cloud pakages

```
root@compute:~# apt install -y software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
software-properties-common is already the newest version (0.96.24.32.22).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@compute:~# _
```

```
compute [Running] - Oracle VM VirtualBox                    —    □

File   Machine   View   Input   Devices   Help

Dec 08 08:36:33 compute systemd[1]: Starting chrony, an NTP client/server..
Dec 08 08:36:34 compute chronyd[1407]: chronyd version 3.2 starting (+CMDMON
Dec 08 08:36:37 compute systemd[1]: Started chrony, an NTP client/server.
Dec 08 08:36:44 compute chronyd[1407]: Selected source 185.125.190.58
Dec 08 08:36:44 compute chronyd[1407]: System clock wrong by 1.967953 secon
Dec 08 08:36:46 compute chronyd[1407]: System clock was stepped by 1.967953
Dec 08 08:38:56 compute chronyd[1407]: Selected source 103.55.68.158
root@compute:~# apt install -y software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
software-properties-common is already the newest version (0.96.24.32.22).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@compute:~# add-apt-repository cloud-archive:rocky
 Ubuntu Cloud Archive for OpenStack Rocky
 More info: https://wiki.ubuntu.com/OpenStack/CloudArchive
Press [ENTER] to continue or Ctrl-c to cancel adding it.

Reading package lists...
Building dependency tree...
Reading state information...
The following NEW packages will be installed:
  ubuntu-cloud-keyring
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 5,908 B of archives.
After this operation, 22.5 kB of additional disk space will be used.
```
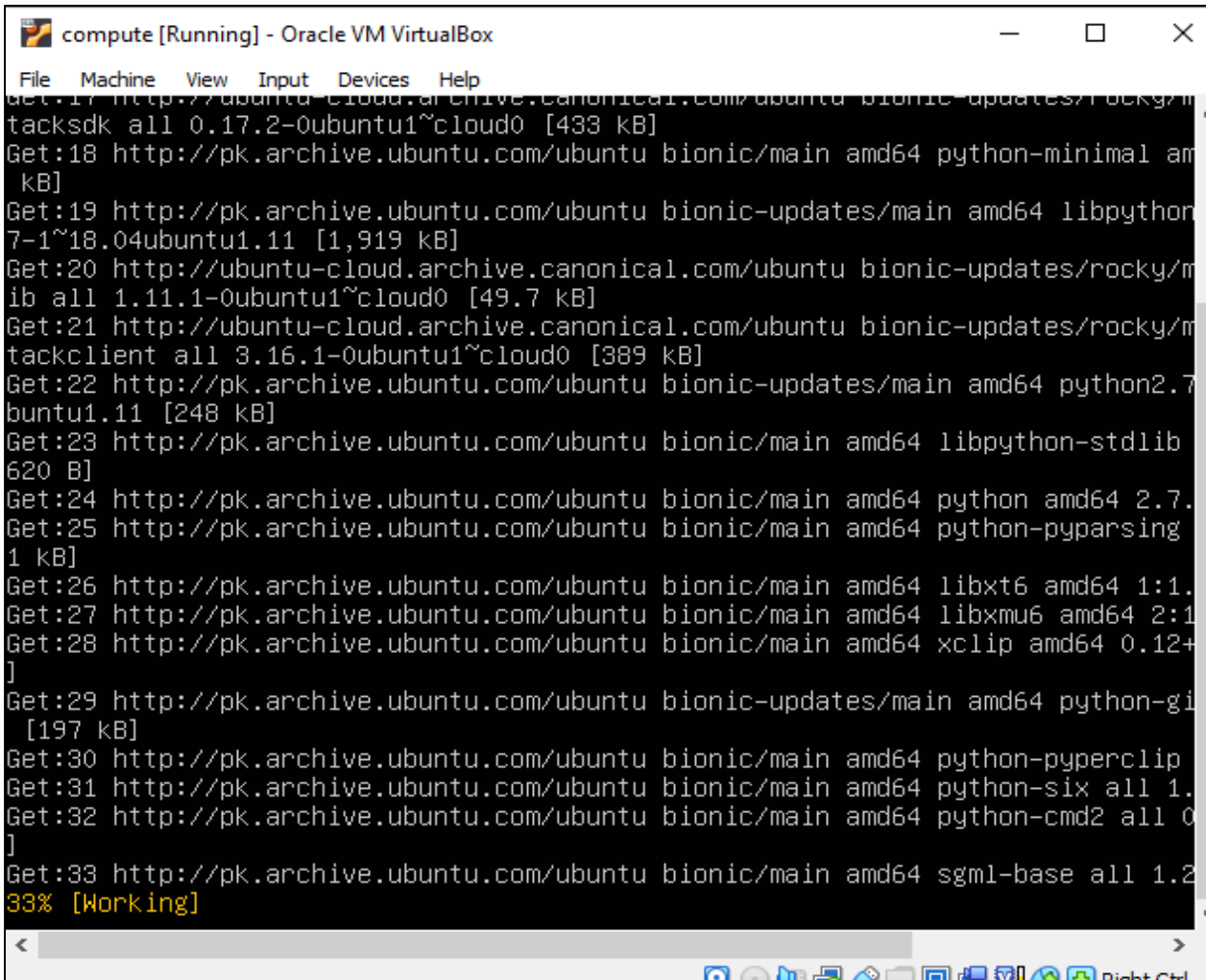
Server:

```
 * Management:      https://landscape.canonical.com
 * Support:         https://ubuntu.com/advantage

  System information as of Fri Dec  8 08:45:01 UTC 2023

  System load:  0.0           Users logged in:         0
  Usage of /:   41.6% of 9.59GB  IP address for enp0s3: 10.0.2.15
  Memory usage: 3%            IP address for enp0s8: 10.0.0.11
  Swap usage:   0%            IP address for enp0s9: 10.13.0.31
  Processes:    97

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


fjwu@server1:~$ sudo su -
[sudo] password for fjwu:
```
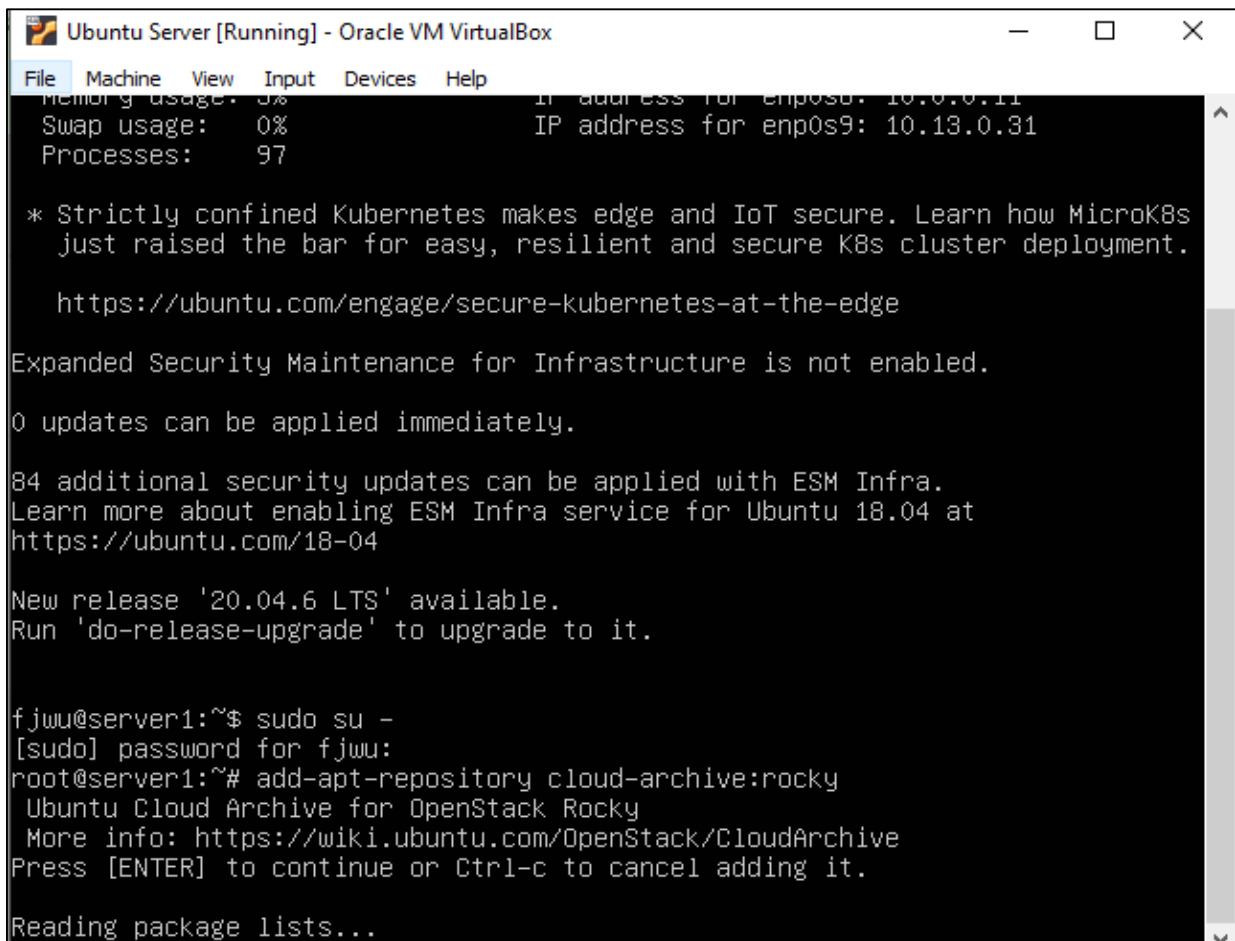
Ubuntu Server [Running] - Oracle VM VirtualBox — □ ×

File   Machine   View   Input   Devices   Help

```
  Memory usage:  3%                IP address for enp0s0: 10.0.0.11
  Swap usage:    0%                IP address for enp0s9: 10.13.0.31
  Processes:     97

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

84 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


fjwu@server1:~$ sudo su -
[sudo] password for fjwu:
root@server1:~# add-apt-repository cloud-archive:rocky
 Ubuntu Cloud Archive for OpenStack Rocky
 More info: https://wiki.ubuntu.com/OpenStack/CloudArchive
Press [ENTER] to continue or Ctrl-c to cancel adding it.

Reading package lists...
```

Store1:

```
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/chrony.service
           └─1489 /usr/sbin/chronyd

Dec 08 04:41:48 store1 systemd[1]: Starting chrony, an NTP client/server...
Dec 08 04:41:49 store1 chronyd[1489]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PRI
Dec 08 04:41:49 store1 chronyd[1489]: Frequency 14.892 +/- 0.197 ppm read from /var/lib/chrony/chron
Dec 08 04:41:49 store1 systemd[1]: Started chrony, an NTP client/server.
Dec 08 04:41:58 store1 chronyd[1489]: Selected source 59.103.236.10
Dec 08 04:41:58 store1 chronyd[1489]: System clock wrong by 5914.820753 seconds, adjustment started
Dec 08 06:20:33 store1 chronyd[1489]: System clock was stepped by 5914.820753 seconds
Dec 08 06:20:45 store1 chronyd[1489]: Source 2001:470:ec42:60:49e2:5be6:b73:7449 replaced with 203.8
Dec 08 06:20:51 store1 chronyd[1489]: Received KoD RATE from 203.80.128.20
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
root@store1:~# apt-get-repository cloud-archive:rocky
apt-get-repository: command not found
root@store1:~# add-apt-repository cloud-archive:rocky
 Ubuntu Cloud Archive for OpenStack Rocky
 More info: https://wiki.ubuntu.com/OpenStack/CloudArchive
Press [ENTER] to continue or Ctrl-c to cancel adding it.

Reading package lists...
```

Store2:

```
           man:chrony.conf(5)
 Main PID: 1310 (chronyd)
    Tasks: 1 (limit: 1102)
   CGroup: /system.slice/chrony.service
           └─1310 /usr/sbin/chronyd

Dec 08 06:24:51 store2 systemd[1]: Starting chrony, an NTP client/server...
Dec 08 06:24:52 store2 chronyd[1310]: chronyd version 3.2 starting (+CMDMON +NTP +REFCLOCK +RTC +PRI
Dec 08 06:24:53 store2 systemd[1]: Started chrony, an NTP client/server.
Dec 08 06:25:01 store2 chronyd[1310]: Selected source 103.55.68.158
Dec 08 06:25:01 store2 chronyd[1310]: System clock wrong by 1.704545 seconds, adjustment started
Dec 08 06:25:02 store2 chronyd[1310]: System clock was stepped by 1.704545 seconds
Dec 08 06:25:14 store2 chronyd[1310]: Source 2001:1490:0:800::41 replaced with 59.103.236.9
Dec 08 06:31:32 store2 chronyd[1310]: Selected source 185.125.190.58
~
~
~
~
```

```
~
~
root@store2:~# add-apt-repository cloud-archive:rocky
 Ubuntu Cloud Archive for OpenStack Rocky
 More info: https://wiki.ubuntu.com/OpenStack/CloudArchive
Press [ENTER] to continue or Ctrl-c to cancel adding it.

Reading package lists...
```

Compute:


```
Setting up ubuntu-cloud-keyring (2018.09.18.1 18.04.2) ...
Hit:1 http://pk.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://pk.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://pk.archive.ubuntu.com/ubuntu bionic-backports InRelease
Get:4 http://ubuntu-cloud.archive.canonical.com/ubuntu bionic-updates/rocky
Hit:5 http://pk.archive.ubuntu.com/ubuntu bionic-security InRelease
Reading package lists... Done
E: Release file for http://ubuntu-cloud.archive.canonical.com/ubuntu/dists/
lease is not valid yet (invalid for another 52min 12s). Updates for this re
ied.
root@store1:~# apt install -y python-openstackclient_
```

```
Get:2 http://ubuntu-cloud.archive.canonical.com/ubuntu bionic-updates
Hit:3 http://pk.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 http://pk.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:5 http://pk.archive.ubuntu.com/ubuntu bionic-security InRelease
Reading package lists... Done
E: Release file for http://ubuntu-cloud.archive.canonical.com/ubuntu/
lease is not valid yet (invalid for another 51min 50s). Updates for
ied.
root@store2:~# apt install -y python-openstackclient_
```

```
Get:4 http://ubuntu-cloud.archive.canonical.com/ubuntu bionic-updates/rocky In
Hit:5 http://pk.archive.ubuntu.com/ubuntu bionic-security InRelease
Get:6 http://ubuntu-cloud.archive.canonical.com/ubuntu bionic-updates/rocky/ma
 kB]
Fetched 127 kB in 3s (49.1 kB/s)
Reading package lists... Done
root@server1:~# apt install -y pyhton-openstackclient_
```

Step 4:

Install mariadb database

```
Setting up liblwp-mediatypes-perl (6.02-1) ...
Setting up libaio1:amd64 (0.3.110-5ubuntu0.1) ...
Setting up galera-3 (25.3.20-1) ...
Setting up liburi-perl (1.73-1) ...
Setting up libhtml-parser-perl (3.72-3build1) ...
Setting up libcgi-pm-perl (4.38-1) ...
Setting up libmysqlclient20:amd64 (5.7.42-0ubuntu0.18.04.1) ...
Setting up libfcgi-perl (0.78-2build1) ...
Setting up libdbi-perl (1.640-1ubuntu0.3) ...
Setting up libhttp-date-perl (6.02-1) ...
Setting up mariadb-server-core-10.1 (1:10.1.48-0ubuntu0.18.04.1) ...
Setting up libhtml-template-perl (2.97-1) ...
Setting up mariadb-client-core-10.1 (1:10.1.48-0ubuntu0.18.04.1) ...
Setting up libcgi-fast-perl (1:2.13-1) ...
Setting up libhttp-message-perl (6.14-1) ...
Setting up libdbd-mysql-perl (4.046-1) ...
Setting up mariadb-client-10.1 (1:10.1.48-0ubuntu0.18.04.1) ...
Setting up mariadb-server-10.1 (1:10.1.48-0ubuntu0.18.04.1) ...
Created symlink /etc/systemd/system/mysql.service → /lib/systemd/system/mariad
Created symlink /etc/systemd/system/mysqld.service → /lib/systemd/system/maria
Created symlink /etc/systemd/system/multi-user.target.wants/mariadb.service →
riadb.service.
Setting up mariadb-server (1:10.1.48-0ubuntu0.18.04.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
Processing triggers for systemd (237-3ubuntu10.57) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
root@server1:~# vim /etc/mysql/mariadb.conf.d/99-openstack.cnf
```
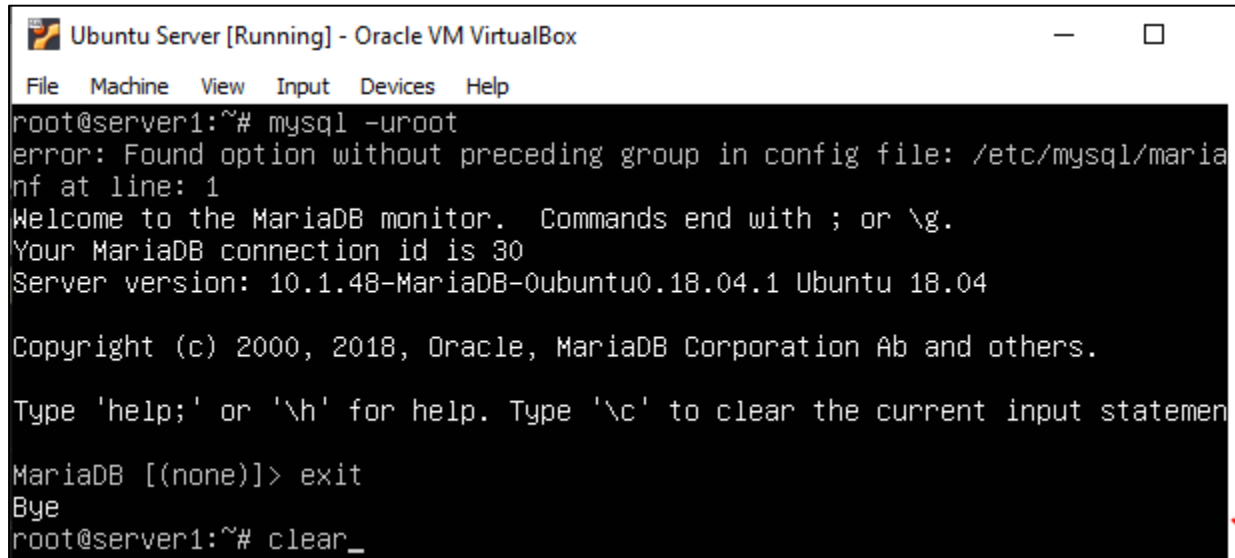
```
bind-address = 10.0.0.11
default-storage-engine = innodb
innodb_file_per_table =  on
max_connections = 4096
collation-server = utf8_general_ci
character-set-server = utf8
~
~
~
~
~
```

```
root@server1:~# systemctl status mysql
• mariadb.service - MariaDB 10.1.48 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset
   Active: active (running) since Fri 2023-12-08 08:59:51 UTC; 6min ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
 Main PID: 6032 (mysqld)
   Status: "Taking your SQL requests now..."
    Tasks: 27 (limit: 4653)
   CGroup: /system.slice/mariadb.service
           └─6032 /usr/sbin/mysqld

Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: mysql
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: performance_schema
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: Phase 6/7: Checking and
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: Processing databases
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: information_schema
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: performance_schema
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: Phase 7/7: Running 'FLU
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6068]: OK
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6135]: Checking for insecure r
Dec 08 08:59:52 server1 /etc/mysql/debian-start[6139]: Triggering myisam-recov
lines 1-21/21 (END)
```

```
~
root@server1:~#
root@server1:~#
root@server1:~#
root@server1:~# systemctl enable mariadb
root@server1:~# systemctl restart_mariadb
```

```
~
~
~
~
~
root@server1:~#
root@server1:~#
root@server1:~#
root@server1:~# systemctl enable mariadb
root@server1:~# systemctl restart mariadb
root@server1:~# systemctl status mariadb
```
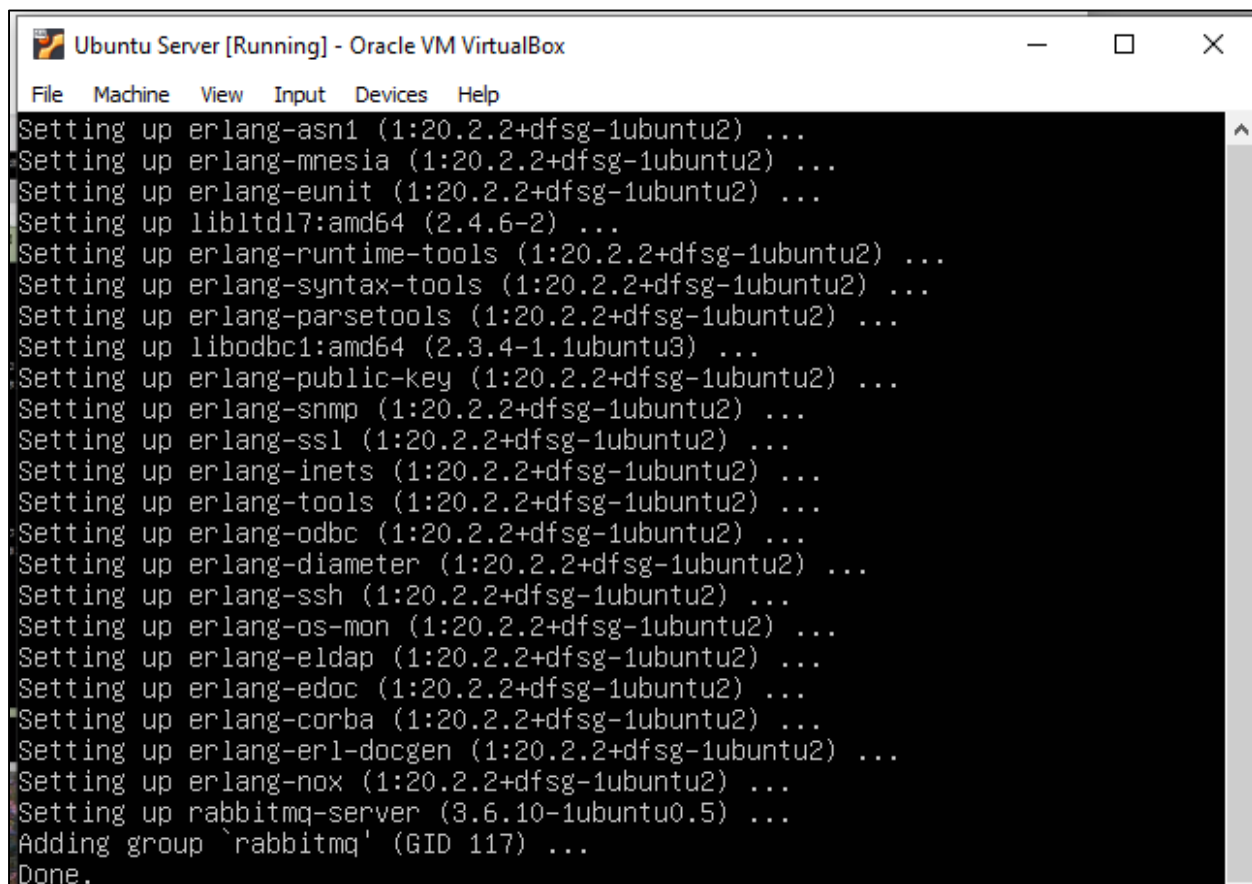
Step 5:

Install and configure rabbitmq on server node

```
Adding group `rabbitmq' (GID 117) ...
Done.
Adding system user `rabbitmq' (UID 114) ...
Adding new user `rabbitmq' (UID 114) with group `rabbitmq' ...
Not creating home directory `/var/lib/rabbitmq'.
Created symlink /etc/systemd/system/multi-user.target.wants/rabbitmq-server.se
ystem/rabbitmq-server.service.
Processing triggers for systemd (237-3ubuntu10.57) ...
```

```
Not creating home directory `/var/lib/rabbitmq'.
Created symlink /etc/systemd/system/multi-user.target.wants/rabbitmq-server.se
ystem/rabbitmq-server.service.
Processing triggers for systemd (237-3ubuntu10.57) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
root@server1:~# rabbitmqctl add_user openstack rabbitPass
```
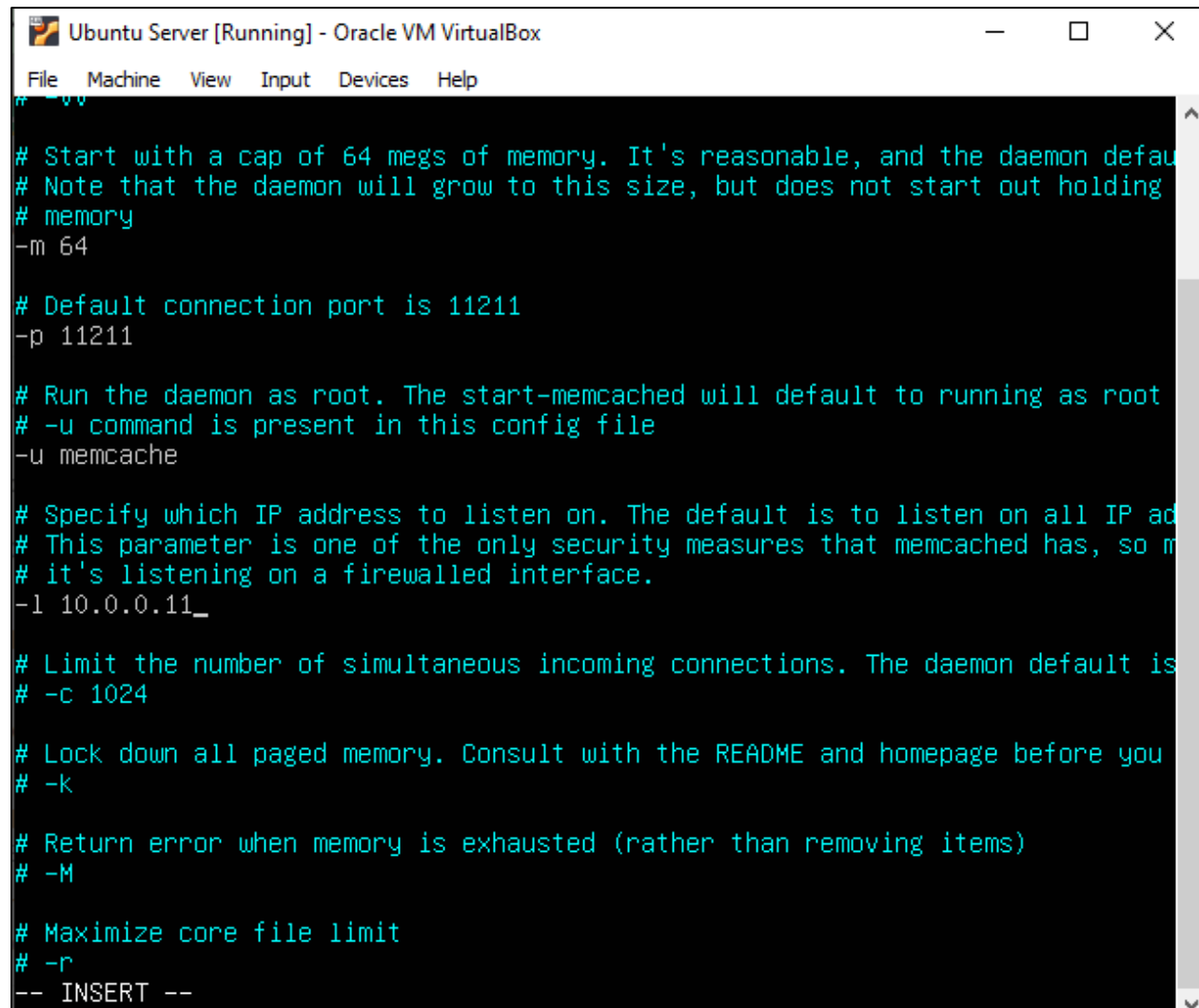
```
root@server1:~# rabbitmqctl add_user openstack rabbitPass
Creating user "openstack"
root@server1:~# rabbitmqctl set_permissions openstack ".*" ".*" ".*"
Setting permissions for user "openstack" in vhost "/"
```

Step 6:

Install and configure memcashed

```
Setting permissions for user "openstack" in vhost "/"
root@server1:~# apt install -y memcached python-memcache
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  libcache-memcached-perl libmemcached libanyevent-perl libyaml-perl
The following NEW packages will be installed:
  memcached python-memcache
0 upgraded, 2 newly installed, 0 to remove and 1 not upgraded.
Need to get 127 kB of archives.
After this operation, 372 kB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 memcached
 [109 kB]
Get:2 http://pk.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python-mem
0.18.04.1 [17.4 kB]
Fetched 127 kB in 2s (56.3 kB/s)
Selecting previously unselected package memcached.
(Reading database ... 82167 files and directories currently installed.)
Preparing to unpack .../memcached_1.5.6-0ubuntu1.2_amd64.deb ...
Unpacking memcached (1.5.6-0ubuntu1.2) ...
Selecting previously unselected package python-memcache.
Preparing to unpack .../python-memcache_1.57-2ubuntu0.18.04.1_all.deb ...
Unpacking python-memcache (1.57-2ubuntu0.18.04.1) ...
Setting up memcached (1.5.6-0ubuntu1.2) ...
Created symlink /etc/systemd/system/multi-user.target.wants/memcached.service
memcached.service.

Progress: [ 64%] [#############################################..........
```

```
memcached.service.
Setting up python-memcache (1.57-2ubuntu0.18.04.1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for systemd (237-3ubuntu10.57) ...
root@server1:~# vim /etc/memcached.conf
```
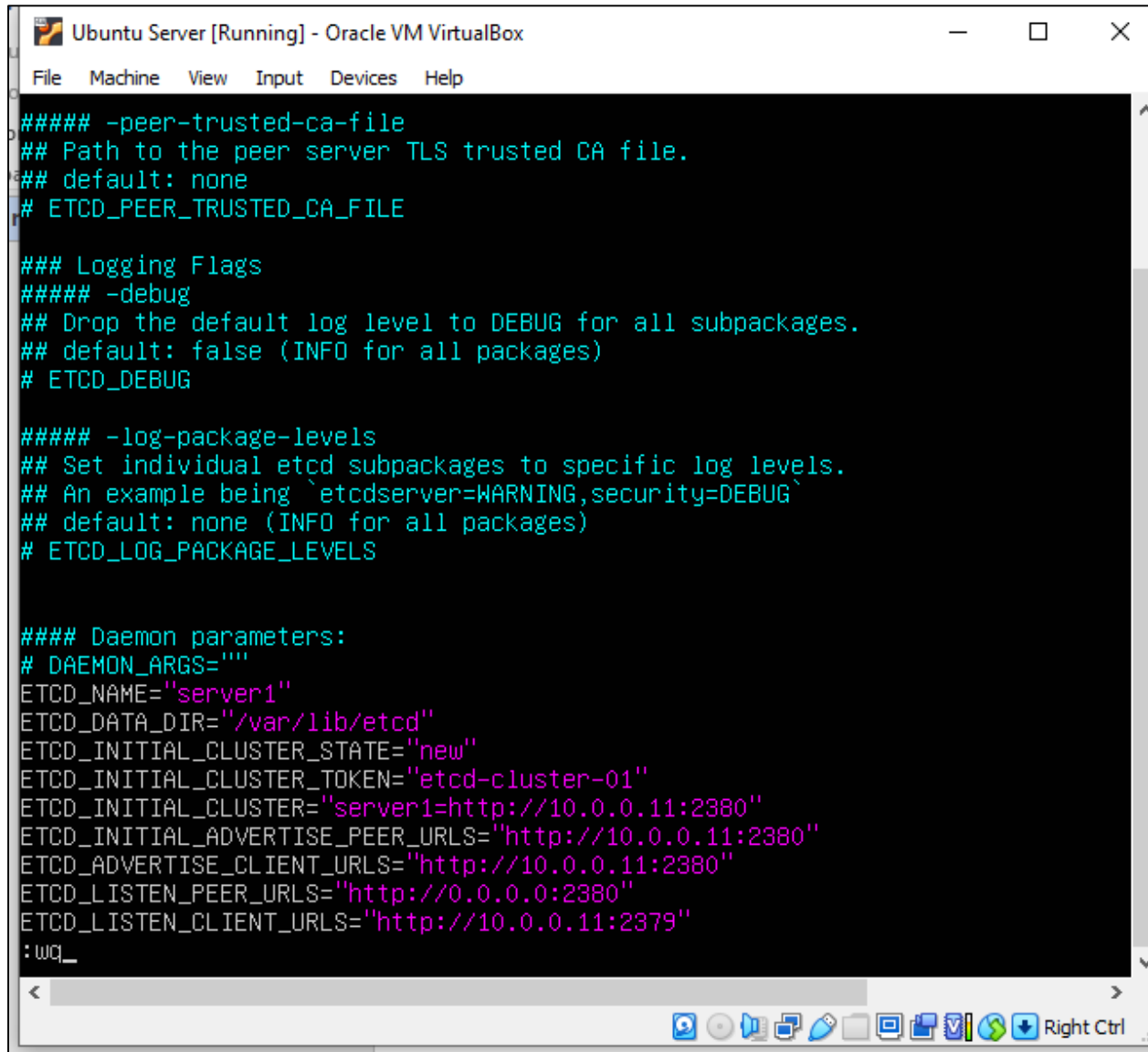
```
# -vv

# Start with a cap of 64 megs of memory. It's reasonable, and the daemon defau
# Note that the daemon will grow to this size, but does not start out holding
# memory
-m 64

# Default connection port is 11211
-p 11211

# Run the daemon as root. The start-memcached will default to running as root
# -u command is present in this config file
-u memcache

# Specify which IP address to listen on. The default is to listen on all IP ad
# This parameter is one of the only security measures that memcached has, so m
# it's listening on a firewalled interface.
-l 10.0.0.11_

# Limit the number of simultaneous incoming connections. The daemon default is
# -c 1024

# Lock down all paged memory. Consult with the README and homepage before you
# -k

# Return error when memory is exhausted (rather than removing items)
# -M

# Maximize core file limit
# -r
-- INSERT --
```

Ubuntu Server [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
root@server1:~# systemctl enable memcached
Synchronizing state of memcached.service with SysV service script with /lib/sy
tall.
Executing: /lib/systemd/systemd-sysv-install enable memcached
root@server1:~# _
```


Ubuntu Server [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
root@server1:~# systemctl enable memcached
Synchronizing state of memcached.service with SysV service script with /lib/sy
tall.
Executing: /lib/systemd/systemd-sysv-install enable memcached
root@server1:~# systemctl restart memcached
root@server1:~# apt install -y etcd
```


Ubuntu Server [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
root@server1:~# systemctl enable memcached
Synchronizing state of memcached.service with SysV service script with /lib/s
tall.
Executing: /lib/systemd/systemd-sysv-install enable memcached
root@server1:~# systemctl restart memcached
root@server1:~# apt install -y etcd
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  etcd-client etcd-server pipexec
The following NEW packages will be installed:
  etcd etcd-client etcd-server pipexec
0 upgraded, 4 newly installed, 0 to remove and 1 not upgraded.
Need to get 12.4 MB of archives.
After this operation, 52.2 MB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu bionic/universe amd64 pipexec amd64
Get:2 http://pk.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 etcd-
g-1ubuntu0.1 [8,129 kB]
27% [2 etcd-client 3,477 kB/8,129 kB 43%]_
```

```
Setting up etcd (3.2.17+dfsg-1ubuntu0.1) ...
Processing triggers for systemd (237-3ubuntu10.57) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
root@server1:~# vim /etc/default/etcd_
```

```
##### -peer-trusted-ca-file
## Path to the peer server TLS trusted CA file.
## default: none
# ETCD_PEER_TRUSTED_CA_FILE

### Logging Flags
##### -debug
## Drop the default log level to DEBUG for all subpackages.
## default: false (INFO for all packages)
# ETCD_DEBUG

##### -log-package-levels
## Set individual etcd subpackages to specific log levels.
## An example being `etcdserver=WARNING,security=DEBUG`
## default: none (INFO for all packages)
# ETCD_LOG_PACKAGE_LEVELS


#### Daemon parameters:
# DAEMON_ARGS=""
ETCD_NAME="server1"
ETCD_DATA_DIR="/var/lib/etcd"
ETCD_INITIAL_CLUSTER_STATE="new"
ETCD_INITIAL_CLUSTER_TOKEN="etcd-cluster-01"
ETCD_INITIAL_CLUSTER="server1=http://10.0.0.11:2380"
ETCD_INITIAL_ADVERTISE_PEER_URLS="http://10.0.0.11:2380"
ETCD_ADVERTISE_CLIENT_URLS="http://10.0.0.11:2380"
ETCD_LISTEN_PEER_URLS="http://0.0.0.0:2380"
ETCD_LISTEN_CLIENT_URLS="http://10.0.0.11:2379"
:wq_
```

Ubuntu Server [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
root@server1:~# systemctl enable etcd
Synchronizing state of etcd.service with SysV service script with /lib/systemd
Executing: /lib/systemd/systemd-sysv-install enable etcd
Created symlink /etc/systemd/system/etcd2.service → /lib/systemd/system/etcd.s
root@server1:~# systemctl start etcd
root@server1:~# systemctl status_etcd
```


Ubuntu Server [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
root@server1:~# systemctl enable etcd
Synchronizing state of etcd.service with SysV service script with /lib/systemd
Executing: /lib/systemd/systemd-sysv-install enable etcd
Created symlink /etc/systemd/system/etcd2.service → /lib/systemd/system/etcd.s
root@server1:~# systemctl start etcd
root@server1:~# systemctl status etcd
● etcd.service - etcd - highly-available key value store
   Loaded: loaded (/lib/systemd/system/etcd.service; enabled; vendor preset: e
   Active: active (running) since Fri 2023-12-08 09:22:05 UTC; 10min ago
     Docs: https://github.com/coreos/etcd
           man:etcd
 Main PID: 9439 (etcd)
    Tasks: 11 (limit: 4653)
   CGroup: /system.slice/etcd.service
           └─9439 /usr/bin/etcd

Dec 08 09:22:05 server1 etcd[9439]: 8e9e05c52164694d received MsgVoteResp from
Dec 08 09:22:05 server1 etcd[9439]: 8e9e05c52164694d became leader at term 2
Dec 08 09:22:05 server1 etcd[9439]: raft.node: 8e9e05c52164694d elected leader
Dec 08 09:22:05 server1 etcd[9439]: published {Name:server1 ClientURLs:[http:/
Dec 08 09:22:05 server1 etcd[9439]: setting up the initial cluster version to
Dec 08 09:22:05 server1 etcd[9439]: set the initial cluster version to 3.2
Dec 08 09:22:05 server1 etcd[9439]: enabled capabilities for version 3.2
Dec 08 09:22:05 server1 etcd[9439]: ready to serve client requests
Dec 08 09:22:05 server1 systemd[1]: Started etcd - highly-available key value
Dec 08 09:22:05 server1 etcd[9439]: serving insecure client requests on 127.0.
lines 1-20/20 (END)
```